

Motor Summit 08

**The G8's Sustainable-Energy
Policy Initiatives:
Will there be a higher priority for
energy-saving in electric-motor
driven systems?**

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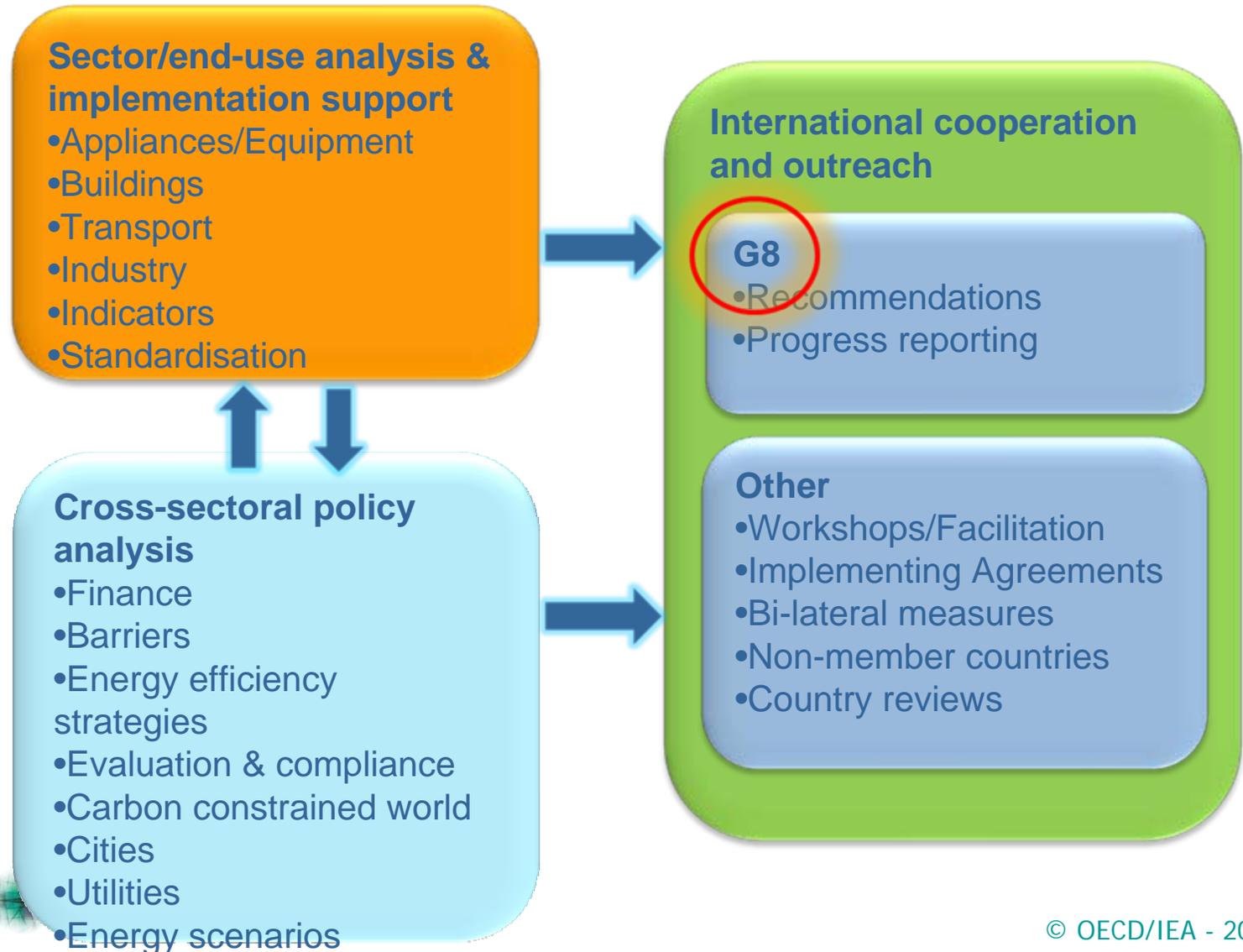
Energy Efficiency & Environment Division

International Energy Agency

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IEA energy efficiency policy analysis





Major economies are setting ambitious efficiency targets

- **China: -20% energy/GDP by 2010 (-4% p.a.)**
- **Japan: -30% energy/GDP by 2020 (-2.9% p.a.)**
- **EU: -20% by 2020 (-1.8% p.a.)**

Broader context are GHG reductions targets e.g.

- **EU: -20% by 2020 but -30% if global agreement**
- **Japan: -50% by 2050**
- **France: -75% by 2050**
- **UK: -80% by 2050 but to be made legally binding with three intermediate carbon budget steps (5 year carbon budgets with binding limits each 15 years)**



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Principles behind IEA's efficiency policy recommendations for G8



➤ there's a high degree of international
consensus



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G8 pledge to implement the 25 measures at the Toyako summit

- “We recognize the importance of setting mid-term, aspirational goals for energy efficiency. In national goals and objectives, as well as in country specific action plans, **we will maximize implementation of the IEA's 25 recommendations on energy efficiency**”
- “We welcome the recent decision to establish the **International Partnership for Energy Efficiency Cooperation (IPEEC)**”
- “We will **establish an international initiative with the support of the IEA to develop roadmaps for innovative technologies** and cooperate upon existing and new partnerships, including carbon capture and storage (CCS) and advanced technologies”.

IEA energy efficiency policy recommendations to the G8+5

25 recommendations address:

- Buildings
- Appliances
- Lighting
- Transport
- Industry
- Utilities
- Cross-sectoral

1	The IEA recommends action on energy efficiency across sectors. In particular, the IEA calls for action on: <ul style="list-style-type: none">1.1 Measures for increasing investment in energy efficiency;1.2 National energy efficiency strategies and goals;1.3 Compliance, monitoring, enforcement and evaluation of energy efficiency measures;1.4 Energy efficiency indicators;1.5 Monitoring and reporting progress with the IEA energy efficiency recommendations themselves.
2	Buildings account for about 40% of energy used in most countries. To save a significant portion of this energy, the IEA recommends action on: <ul style="list-style-type: none">2.1 Building codes for new buildings;2.2 Passive Energy Houses and Zero Energy Buildings;2.3 Policy packages to promote energy efficiency in existing buildings;2.4 Building certification schemes;2.5 Energy efficiency improvements in windows.
3	Appliances and equipment represent one of the fastest growing energy loads in most countries. The IEA recommends action on: <ul style="list-style-type: none">3.1 Mandatory energy performance requirements or labels;3.2 Low-power modes, including standby power, for electronic and networked equipment;3.3 Televisions and "set-top" boxes;3.4 Energy performance test standards and measurement protocols.
4	Saving energy by adopting efficient lighting technology is very cost-effective. The IEA recommends action on: <ul style="list-style-type: none">4.1 Best practice lighting and the phase-out of incandescent bulbs;4.2 Ensuring least-cost lighting in non-residential buildings and the phase-out of inefficient fuel-based lighting.
5	About 60% of world oil is consumed in the transport sector. To achieve significant savings in this sector, the IEA recommends action on: <ul style="list-style-type: none">5.1 Fuel-efficient tyres;5.2 Mandatory fuel efficiency standards for light-duty vehicles;5.3 Fuel economy of heavy-duty vehicles;5.4 Eco-driving.
6	In order to improve energy efficiency in industry, action is needed on: <ul style="list-style-type: none">6.1 Collection of high-quality energy efficiency data for industry;6.2 Energy performance of electric motors;6.3 Assistance in developing energy management capability;6.4 Policy packages to promote energy efficiency in small- and medium-sized enterprises.
7	Energy utilities can play an important role in promoting energy efficiency. Action is needed to promote: <ul style="list-style-type: none">7.1 Utility end-use energy efficiency schemes.

Energy Savings in Electric Motor Systems

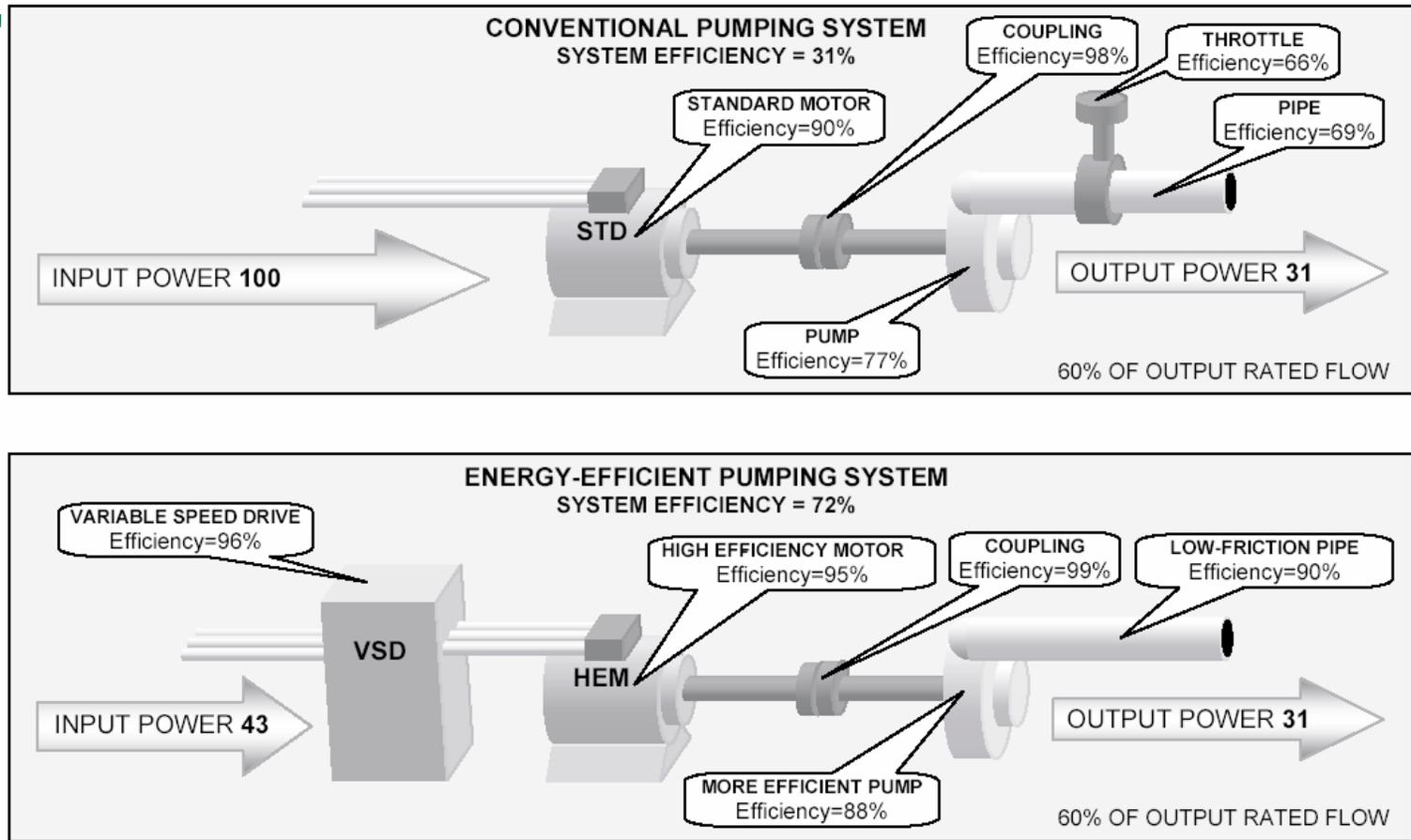


Figure 1 - a) Conventional pumping system (total efficiency = 31%)
b) Energy-efficient pumping system combining efficient technologies (total efficiency = 72%)



IEA E.E. Recommendations to G8: industrial electric motors

1. Industrial electric motors and drives

- a) ***Governments should consider adopting mandatory minimum energy performance standards for electric motors in line with international best practice.***
- b) ***Governments should examine barriers to the optimisation of energy efficiency in electric motor driven systems and design and implement comprehensive policy portfolios aimed at overcoming such barriers.***



IEA E.E. Recommendations to G8: industry

2. a) Governments should consider providing effective assistance in the development of **energy management (EM) capability through the development and maintenance of EM tools, training, certification and quality assurance.**

b) In addition, governments should encourage or require major industrial energy users to implement comprehensive energy management procedures and practices that could include:

I. The development and adoption of a formal energy management policy;

i. progress with implementation of this policy should be reported to and overseen at company board level and reported in the company report;



IEA E.E. Recommendations to G8: industry

*ii. within this policy companies would need to demonstrate that **effective organisational structures have been put in place to ensure that decisions regarding the procurement of energy-using equipment are taken with full knowledge of the equipment's expected life-cycle costs and that procurement managers have an effective Incentive to minimise the life-cycle costs of their acquisitions.***

II. The appointment of full-time qualified energy managers at both the enterprise and plant-specific level as appropriate.

*III. The **establishment of a scheme to monitor, evaluate and report industrial energy consumption and efficiency at the individual company sector and national level.***

i. As a part of this effort appropriate energy performance benchmarks should be developed, monitored and reported at levels deemed suitable in each sector.



IEA E.E. Recommendations to G8: Industrial SMEs

1. **a) Governments should consider developing and implementing a package of policies and measures to promote energy efficiency in small and medium-sized enterprises (SMEs). This package should include:**
 - i) A system for ensuring that energy audits, carried out by qualified engineers, are widely promoted and easily accessible for all SMEs;
 - ii) The provision of high quality and relevant information on energy efficiency best practice;
 - iii) The provision of energy performance benchmarking information that, ideally, would be structured to allow international and national economy comparisons; and
 - iv) Appropriate **incentives to adopt least-life cycle cost capital acquisition and procurement procedures.**



IEA E.E. Recommendations to G8: Utility Energy Efficiency Schemes

1. **a) Governments and utility regulators should consider implementing mechanisms that strengthen the incentives for utilities to deliver cost-effective energy savings among end-users such as:**
 - i) **Establishing regulation which decouples utility revenue and profits from energy sales and allows energy savings delivery to compete on equal terms with energy sales; or**
 - ii) **Placing energy efficiency obligations on energy utilities, the stringency of which is periodically raised based on continuing cost effectiveness in delivering energy services, and where;**
 - I. **Such obligations may be tradable and structured such that utility costs are recoverable through the rates;**
 - II. **The obligations are designed to be consistent with any corresponding mandatory or voluntary CO2 emission target imposed on utilities; or**
 - iii) **Allowing energy efficiency measures to be bid into energy pools, on an equal basis to energy supply options; or**



IEA E.E. Recommendations to G8: Utility Energy Efficiency Schemes

iv) Other appropriate policy measures that encourage utilities to play an active part in funding and or delivering end-use efficiency improvements among their customer base.



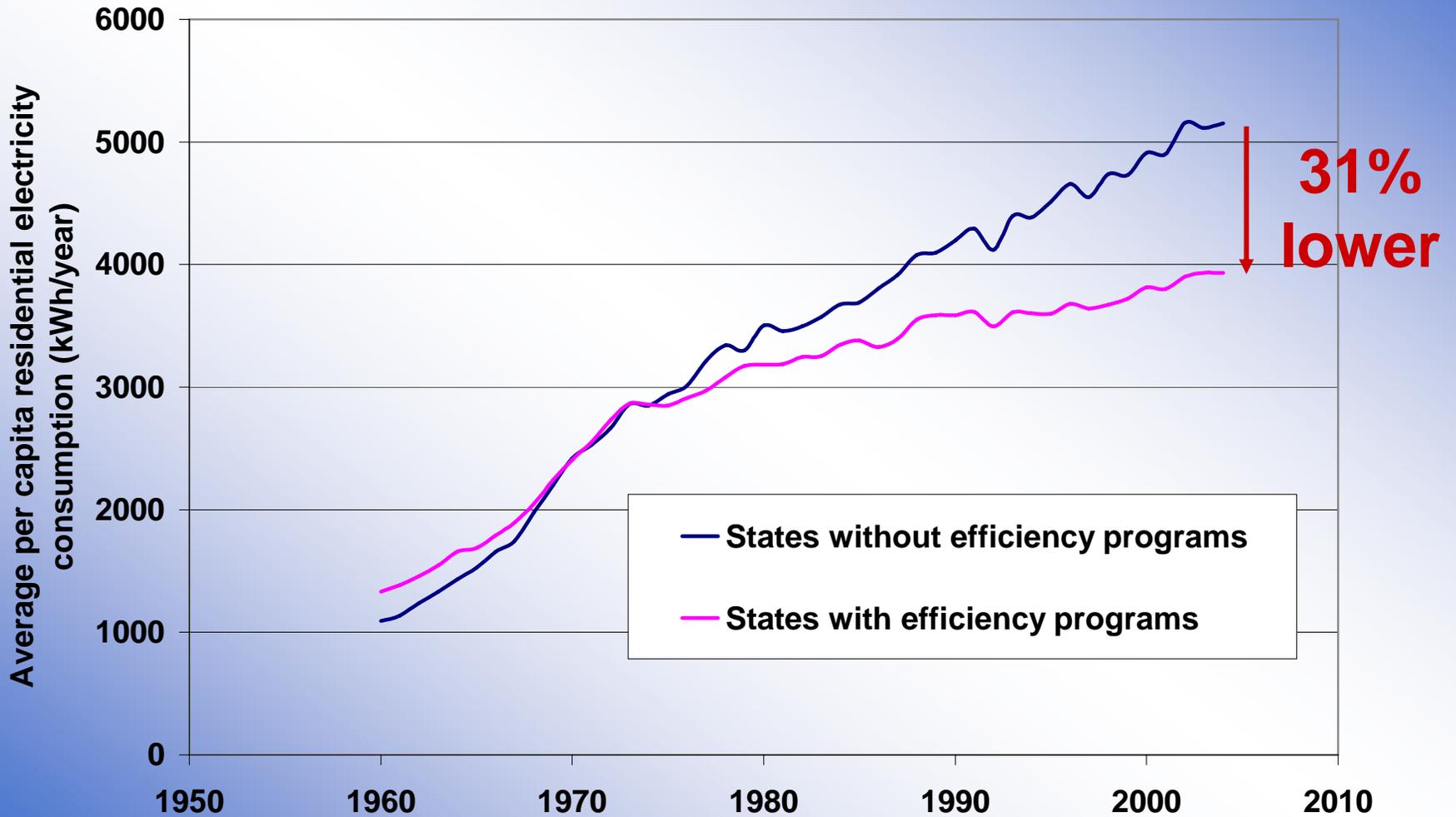
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*In support of the
G8 Plan of Action*





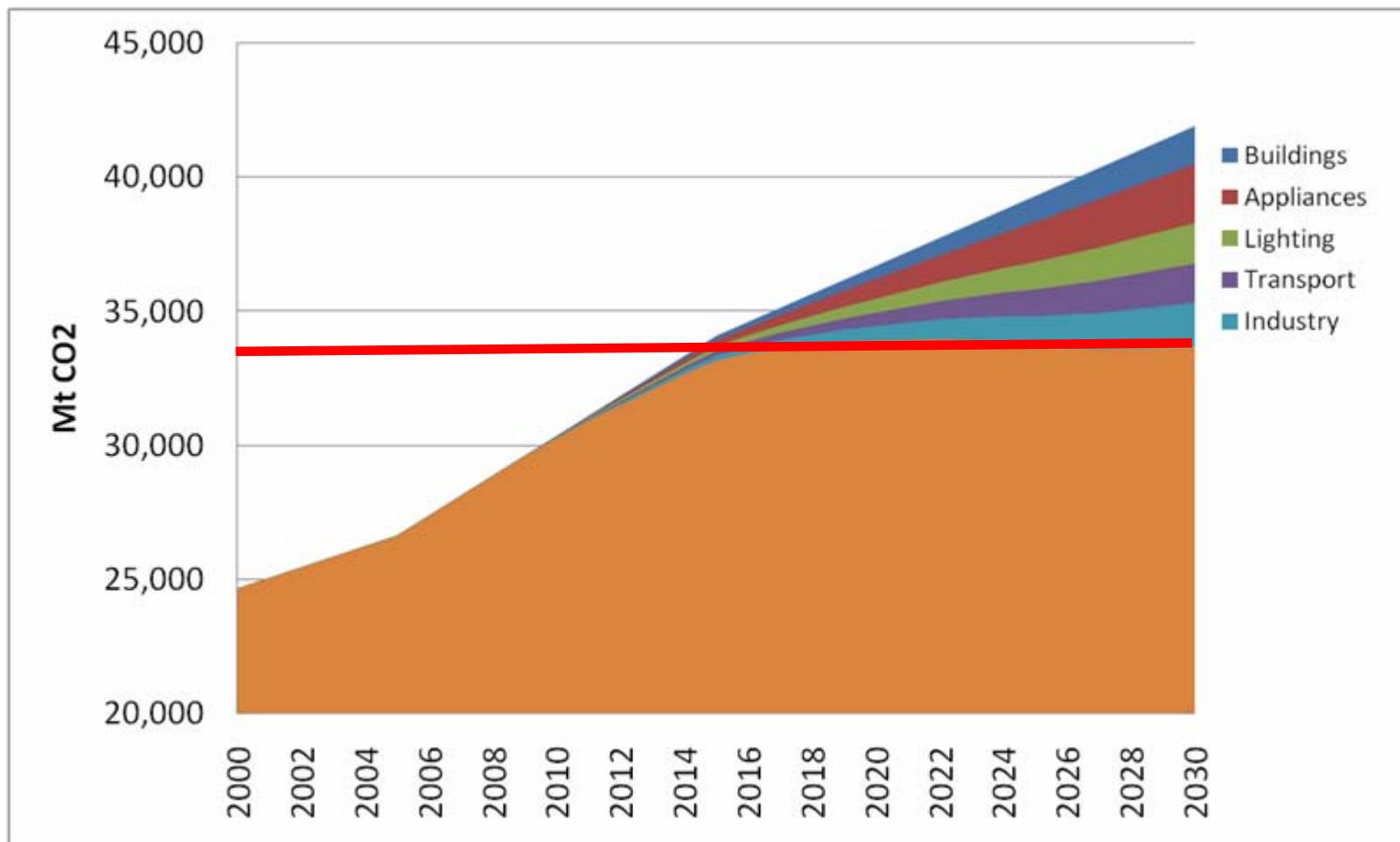
Do utility efficiency schemes work? Half of US states have utility EE progs...





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Estimated impact of full implementation of IEA G8 policy recommendations on world CO₂ emissions



Progress to date

- Many countries are introducing more ambitious policies for buildings
- Many new mandatory energy performance requirements are being set for energy using equipment
- Almost all OECD economies are introducing much more ambitious regulatory measures to encourage efficient lighting
- Many economies have national EE plans including additional financial support and incentives
- New utility EE schemes are underway in many countries
- **All G7 countries have, or are introducing, MEPS for motors**



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Countries in the process of phasing-out incandescent lamps



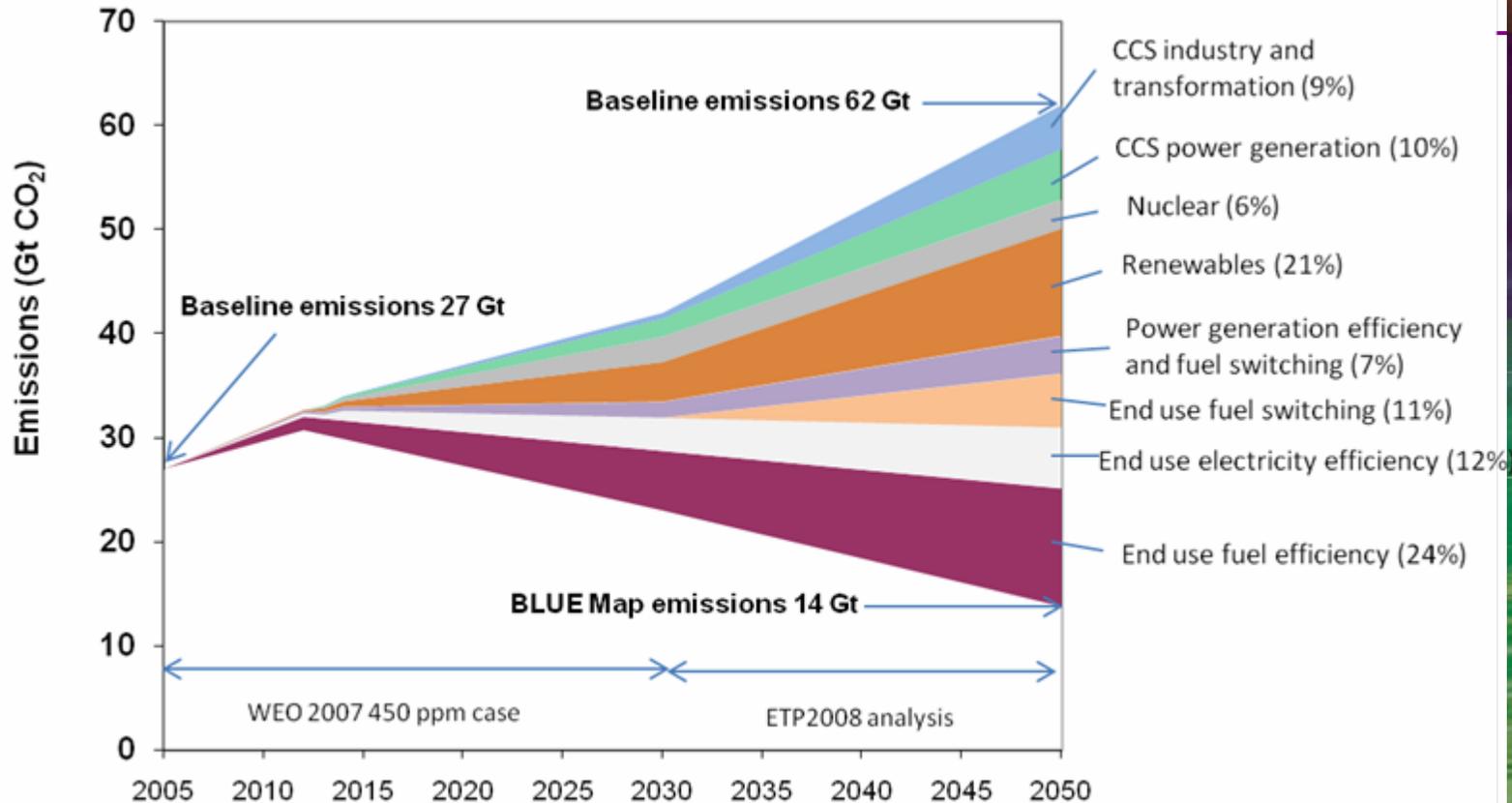
- IEA made recommendations to G8 (2006 & 2007)
- Cuba (already done!)
- Australia + New Zealand (start 2008)
- US (2012-14 but also CA, NV)
- EU (fully by 2010/11 UK, Por, Bel, Ire, Fr)
- Canada + Switzerland (finalising regulation details)
- Japan (drafting requirements)
- Philippines, Thailand, Mexico, Argentina, Tunisia
- China + other non-OECD ?
- Global incandescent lamp sales are now in sharp decline
- Up to 500Mt CO₂ could be saved by 2012

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A New Energy Revolution....

Cutting Energy Related CO₂ emissions



Improved efficiency and decarbonising the power sector could bring emissions back to current levels by 2050. To achieve a 50% cut we would also have to revolutionise the transport sector.

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Key Technology Options (Roadmaps)

● Supply side

- CCS power generation
- Nuclear III + IV
- Wind
- Biomass – IGCC & co-combustion
- Solar – PV
- Solar – CSP
- Coal – IGCC
- Coal – USCSC
- 2nd generation biofuels

● Demand side

- Energy efficiency in buildings
- Heat pumps
- Solar space and water heating
- Energy efficiency in transport
- Electric and plug-in vehicles
- Fuel cell vehicles
- CCS in industry
- **Industrial motor systems**

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Financing Needs *on top of* *Baseline*

- BLUE USD 45 trillion (1.1% of GDP)
- Demand side investments dominate (80%)
- Undiscounted fuel savings worth USD 51 trillion (2010-2050)
 - However valuation at market prices is debatable
- The problem for the BLUE scenario is not the cost but the burden sharing
- Financing needs
 - USD +10 to +100 bln/yr RD&D (short to mid-term)
 - USD +100 to +200 bln/yr learning investments (short to mid-term)
 - USD +1000 to +2000 bln/yr commercial investments (mid-long term)

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Thank you

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